

Scales cycloid ; two rows between eye and angle of præoperculum ; those on the summit of the head with their posterior border festooned.

Colours. Of a dull green on the back and sides, and dirty white along the abdomen. Numerous small and brilliant blue spots along the sides, alternating with rusty-red ones when the fish is alive and in good health, but they fade after death. A light spot on the summit of the head, which is sometimes absent. Dorsal fin white, with a large black spot along its base. Anal orange. Eye silvery.

5. Preliminary Description of a New Species of Finner Whale
(*Balenoptera bonaërensis*). By Dr. H. BURMEISTER,
F.M.Z.S., Director of the Public Museum, Buenos Ayres.

The animal which I now bring before the notice of the scientific public was found dead, floating on the river Plata, near Belgrano, about ten miles from Buenos Ayres, by a fisherman, who brought the body on shore on the 5th of February of this year, and informed me on the next day of his discovery. I was then confined by illness to my room, and was unable to go to see the body until fourteen days later. Putrefaction had already destroyed the Whale's external appearance ; but as I found the body lying on the ground near the shore I was able to take a sufficiently accurate measure of it by steps. It was then 16 paces long, of which nearly 4 belonged to the head, and 12 to the trunk with the tail. Calculating my steps in moderate walking as equal to 2 feet, I made the whole body 32 feet long ; and now measuring the skull alone I find it is 7 feet long, leaving 25 feet for the trunk and tail. This 25 feet is divided in the skeleton in such a manner that 1 foot is occupied by the seven vertebræ of the neck, $3\frac{1}{2}$ feet by the eleven dorsal vertebræ, $8\frac{1}{2}$ feet by the twelve lumbar, and 10 feet by the nineteen of the tail, the 4 additional feet being for the external parts of the animal—the skin, the cellular covering under it, and the intervertebral cartilages.

As the surface was already destroyed by putrefaction, I could not see distinctly the eyes, the ear-openings, or the nostrils. I only observed that the under jaw was about 4 inches longer than the tip of the skull and surrounded the upper jaw in its whole circumference.

Ten paces from the tip of the nose was a triangular falcate dorsal fin about 1 foot high and $1\frac{1}{2}$ foot long ; and on the tip of the tail a large caudal fin with the usual two lobes, about $6\frac{1}{2}$ feet distant from each other at the hinder ends, and each $5\frac{1}{3}$ feet long, and $1\frac{1}{2}$ foot broad at the beginning.

The pectoral fins I could not examine very exactly—the one being already destroyed, and the other covered by the body ; but they appeared to have the usual triangular form, and a length of from $3\frac{1}{2}$ to 4 feet. The rest of the skin was of a dark black-grey colour, like the old clay-slate, but lighter and nearly white-grey on the under-

side. Here I observed the usual deep furrows from the inner edge of the under jaw to the middle of the body; each furrow was $\frac{1}{2}$ inch deep, and the flattened intervals 1 inch broad.

The animal was a male, with two hinder longitudinal openings—the former (somewhat in advance of the position of the dorsal fin) being the sexual opening, and the hinder (under the same fin) the anus. On the fore side of this second opening are the two small mammarial fissures.

Of the internal organs nothing was to be seen, these being already destroyed by putrefaction and eaten by some millions of larvæ of *Musca*, which resembled living waves consuming the whole organic substance of the carcass.

Even the whalebones of the mouth had fallen out, and no trace of them was to be seen on the shore; but one month later we had the good fortune to find one side of them very well preserved in the ground of the river some miles higher up.

The fisherman told me that when he found the body the mouth was already open, and without whalebones, the tongue being very much swollen, like a balloon. This may have forced the whalebones from their position.

Since this first inspection I have visited the body from time to time to preserve the bones for the Museum. During the last week all the bones were brought to the establishment, and have been arranged in such a manner that I can give a short description of the whole skeleton.

Beginning with the skull, I will not describe its general form, which is very well shown in the figure of the skull of the European *Balænoptera rostrata* in the 'Voyage of the Erebus and Terror,' Mammalia, pt. 2, and the description given by my friend Dr. J. E. Gray in the same work.

Comparing the skull of this new species with his figure, I find that it is certainly much larger, but presenting the same relation between the two principal portions, being from the tip to the nasal bones 4' 4" long, and from these to the occipital foramen 2' 8". But there is some difference in the construction of this hinder portion, as the fore end of the vertex reaches to the hinder end of the nasal bones, covering entirely by its middle prolonged protuberance the small frontal bone from above. Much smaller also in my skull is the lateral part of the same bone, which forms the orbital cavity, and somewhat stronger the hinder lateral process of the temporal bone to which is attached the under jaw.

These differences leave no doubt that the two animals belong to different species. The transverse extent of the front part immediately before the nasal bones is 2' 10", that of the hinder angles of the frontal bones behind the orbit is 4', and that of the vertex behind across the occipital foramen 2' 6". The lower jaw is, including the curve, 7' 5" long on the outside.

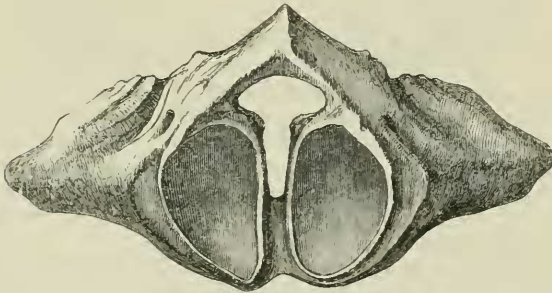
The whale-bone, which was attached to the underside of the large excavated maxillary bones, is of the usual form and construction. We have the left side nearly complete, wanting only a small portion

of the hinder end. The remaining part is composed of 192 plates; and from the form of the last it may be supposed that a series of 30 or 40 plates is lost on the hinder end, so that the whole series of plates may have been from 230 to 235. The first plates are very small, not higher than 3 inches, of which 2 inches are long bristles; but the hinder plates are 12 inches high without the bristles, and the bristles here are more than 3 inches long. These hinder plates have a base 7 inches broad and an elongated triangular figure, the side with the bristles being the largest, like the hypotenuse of the triangle, and somewhat curved to the exterior.

It is well known by the description of different authors* that there are three or even four series of plates in the internal basal margin of the larger external series. In my specimen the second series of plates is preserved, but the two or three smaller most internal series are lost. The plates of this second series are of the same triangular figure, but no higher than $\frac{1}{2}$ to 3 inches, with short bristles of $\frac{1}{2}$ inch on the inside. All these interior plates are of a white colour in my specimen; and of the same colour is also the whole inside of the large external series, every plate of that series being black on the outer margin for a space of 2 inches.

The neck is composed in the usual manner of seven small vertebræ, of which the second, third, and fourth are united together by the bodies and by ossified commissures on the central portion of the arch. The first or *atlas* (fig. 1, anterior surface) is much broader

Fig. 1.

Anterior surface of atlas of *B. bonaërensis*.

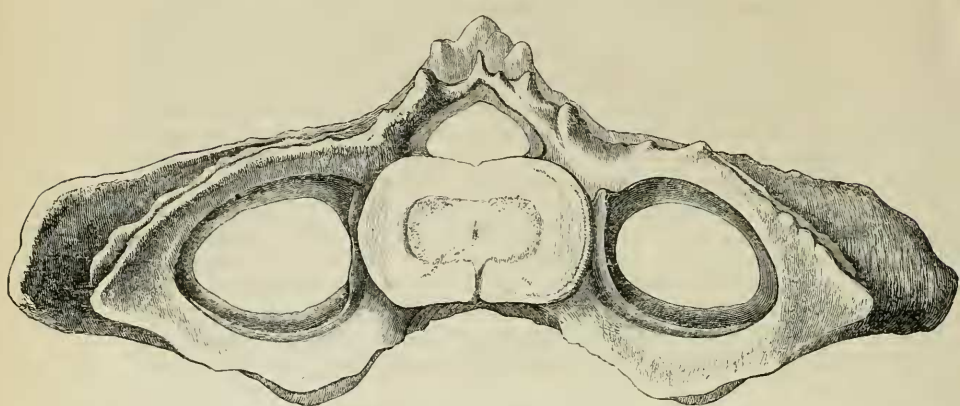
than high, the horizontal diameter between the transverse processes being $15\frac{3}{4}$ inches, and the perpendicular in the middle only $9\frac{1}{2}$ ". Projecting these diameters in lines, the transverse diameter is situate somewhat above the middle of the perpendicular. The articular surfaces for the occipital condyles are together $7\frac{1}{2}$ inches broad and each 5" high.

The three following united vertebræ are figured in fig. 2 from

* I find a very correct description of the whalebones of the European species by Ravin in the 'Annal. des Sciences Naturelles,' 2^e sér. Zool. t. v. p. 266, pl. 11.

behind. Each one has a large transverse process, which is perforated in the middle by a great elliptical opening. In the very strong second vertebra this opening is the smallest, and the horizontal diameter of the opening shorter ($4\frac{1}{2}$ inches) than the outer end of the transverse process ($5\frac{1}{4}$ inches); but in the two others the opening occupies nearly the whole process, surrounded only by a small osseous ring. The upper part, including the vertebral canal, is broader

Fig. 2.

Second, third, and fourth vertebrae of *B. bonaiensis*.

than high; and this canal is of a depressed triangular figure. The arch is very strong and thick on the second vertebrae, and, in each of the three, armed with three small upright spines, of which the middle is the *processus spinosus*. The fifth vertebra of the neck has quite the same form; its lateral process is a closed osseous ring; but the sixth differs by being open in the middle of the under part of this ring, near the enlarged point, and the seventh by having no under part to the ring, but only the upper half circumference with the enlarged point at the end.

In most of these characters the species differs from the European *B. rostrata*, as this has only in some cases the second and third cervical vertebrae united, and open rings on all, after the second, of which open ring the upper part is smaller than the under, and not provided with the enlarged point at the end, which is present in all the cervical vertebrae after the second of my new species.

The small erect spines on the vertebral arch are also wanting in the European species, and the lateral processes are much shorter in comparison with the transverse diameter of the bodies of the vertebrae. As an individual character of my specimen I must remark that the upper parts of the lateral processes of the sixth and seventh cervical vertebrae are united together on the left side in their whole extent, which seems to me a consequence of disease during the

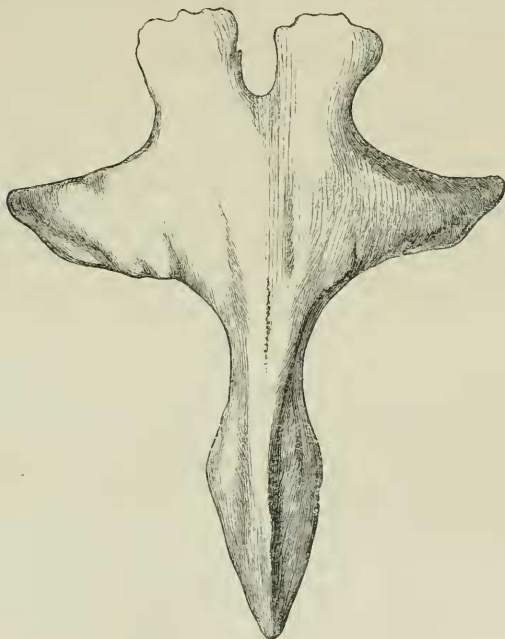
life of the animal; the same circumstance may have also united the first and second dorsal vertebræ, which are also ankylosed to each other at some points of the arch and the upper part of the body. As the animal is a very old one, having no epiphyses separated in the whole skeleton, I must believe that it was wounded when young on the left side of the neck, perhaps by the harpoon of a whaler.

The eleven dorsal vertebræ have the usual form, and increase in size from before backwards rapidly, the body of the first vertebra being only $1\frac{3}{4}$ inch, and the eleventh $5\frac{3}{4}$ inches; they have all long lateral processes, to an excavation on the hinder edge of which are attached the ribs.

The spinous processes increase gradually in height to the middle of the lumbar portion of the vertebral column.

There are eleven pairs of ribs. The first is broader than the others and 2 feet long. The longest is 4 feet in a straight line, and in the middle of the series. The first pair is attached to the sternum, which has a very peculiar form. It is (fig. 3) like a cross, resembling the

Fig. 3.



Sternum of *B. bonaërcus*.

same bone of the European species; but the upper, short branch of the cross is, unlike that of *B. rostrata*, divided into two large parallel lobes. No bone proves more convincingly the distinctness of the

species than the sternum. As my figure gives a clear view of this bone, I will not describe it more, adding only the measurements. The length in the median line is 17 inches, and the transverse diameter in a straight line 13"; the outside is curved downwards and very rough, the inside excavated and smoother.

Of the twelve lumbar vertebræ, the first is 6 inches long, and the last 9 inches; this vertebra is the largest of all. They have higher spinous processes than the dorsals, but shorter and broader lateral processes, this process of the ninth and tenth dorsal vertebræ being the longest of all, *i. e.* 1 foot. The spinous processes of the middle lumbar vertebræ are 17" high; but the lateral processes are only 9" long and 7" broad. They have all thin sharpened outer margins, not an expanded tip for the attachment of the ribs like the dorsals. The tail is composed of nineteen vertebræ, of which the twelve anterior are very strong, but the last six in the axis of the tail-fin extremely small. To the nine anterior caudal vertebræ are attached inferior spinous processes; on the following nine they are wanting. The transverse processes of the first are not perforated. The fifth is the last vertebra with an indication of such a process. The sixth, seventh, and eighth have short spinous processes; but all the others are without either. As far as the thirteenth they have the body perforated. The six last are very small and of a peculiar triangular figure.

The skeleton of the arm-fin is of the usual construction, but has also some peculiarities. The bladebone is rather large, 32 inches broad at the upper margin in a straight line, and 18" high from the glenoid cavity to the same margin. The acromion is 7" long, compressed, and somewhat curved above, with an attenuated end, which is not enlarged as usual in Whales. The coracoid process is, on the contrary, thicker at its end, and rounded like a club, and 4½" long.

The very strong humerus is short, only 11" long; but the forearm-bones are tolerably long, being 23", and the radius somewhat stronger than the ulna, which has a large olecranon like a high crest, of semi-circular figure, which is surrounded by thick and strong cartilage. The carpal bones are seven on each side, all enclosed in thick cartilaginous matter, which united them with the forearm-bones and with the metacarpus of the fin. Two of these seem to be the free lower epiphyses of the radius and ulna, and the remaining five the true carpal bones.

The hand has four fingers, wanting the first or thumb, as usual in the Fin-whales. Each finger has a large metacarpal bone, and the two outer ones two other osseous phalanges; but the largest (second) finger has four phalanges, and the following three. There have been more cartilaginous articulations, but all these are lost. The first phalangeal bone of the second finger is the largest bone of the hand, being 5 inches long. They have no osseous epiphyses on either end, but have been united only by cartilaginous substance.

We have also the small bone of the pelvis, which is 7½ inches long and 1½ inch broad in the middle, and of a lanceolate form, being narrowed at both ends. No vestige of an attachment of another bone

to any part of its surface is visible; and it is the same with the European species, according to the observations of Eschricht and Reinhardt.

The hyoid bone is of the same form as that figured in Cuvier's 'Ossem. Foss.' vol. i. pl. 25. f. 13, being only somewhat larger in the middle, where the two cornua hyoidea are attached. The transverse diameter is 20 inches, and the longitudinal in the middle of one of the two points 7 inches. The cornua have a more curved form than that figured by Cuvier, and are 12 inches long.

Finally I should mention, what I omitted before, that in the cranium is a distinct lachrymal bone on each side in the prolongation of the orbit at the fore end, like that in Cuvier's figures (pl. 26), to which is attached the zygomatic bone, as Cuvier figures the Rorqual of the Cape of Good Hope (fig. 1 of the same plate). The tympanic bone is persistent and firmly united with the cranium; and the vomer rather short, not longer than in the same figures of Cuvier, and divided at the fore end by a longitudinal fissure into two parallel lobes $2\frac{1}{2}$ inches in length.

6. Description of a New Genus of *Spinacidae*, founded upon a Shark obtained at Madeira. By JAMES YATE JOHNSON, C.M.Z.S.

The Shark which forms the subject of the present communication is closely allied to those members of the family *Spinacidae* which constitute the genus *Centrophorus*; but since it possesses a mesial tooth in the lower jaw it cannot be assigned to that genus, and I therefore propose to found upon it a new genus named

MACHEPHILUS.

Body elongate, prismatico-triangular in section; head depressed, not distinct from the body; nostrils on the inferior side of the head; spout-holes large, furnished with valves, and situate on the upper side of the head above the eyes; a deep groove at the commissure of the lips. Scutella (scales) stalked. Two dorsal fins, each supported by a strong spine. No anal fin. The teeth of different form in the two jaws; those of the upper jaw consisting of triangular cusps on subquadrate bases; those of the lower jaw composed of cusps on subquadrate bases, the cusps being more and more inclined backwards as the teeth approach the back of the mouth, thus presenting oblique incisorial edges. A mesial tooth, consisting of an upright equilateral cusp on a quadrate base, in the lower jaw.

MACHEPHILUS DUMERILLI, ♂.

Of a uniform brownish-grey colour. Head rather broad, depressed, PROC. ZOOL. SOC.—1867, No. XLVI.